TITLE

Exercise Device Using Compression Resistance Mechanism

FIELD OF INVENTION

The present invention relates to an exercise device using a resistance mechanism for use in and more particularly relates to an exercise device using a compression resistance mechanism. Said compression mechanism likewise may be used in various other exercise devices or such devices requiring resistive force.

BACKGROUND OF THE INVENTION

Exercise machines are common in today's era. Many are used to target specific areas of the body for strength, cardiovascular health, flexibility and endurance. All are designed around the concept of providing a user's body with some form of work, usually through resistance and repetition, in order to strengthen the various parts of the body desired. On classic example of a particular genre of exercise machines is the "Stepper." Among this classification are walking, running and skiing simulators. Generally, the machine provides a means for moving one's legs and feet in some combination of an up-and-down and/or side-to-side motion. These devices may not only be used to target leg strength, but also cardiovascular health and torso strength and flexibility. Perhaps one of the most effective machines of this sort for all three aspects are ski simulators. For example, U.S. Pat No. 6,231,484 (2001) to Gordon; U.S. Pat. No. 6,139,473 (2000) to Koyama, et al.; U.S. Pat. No. 6,077,202 (2000) to Gray; U.S. Pat. No. 5,989,163 (1999) to Rodgers, Jr.; U.S. Pat. No. 5,800,313 (1998) to Yu; U.S. Pat. No. 5,665,033 (1997) to Palmer; and 4,342,453 (1982) to Wagner are all illustrative of the prior art.

While the aforementioned inventions accomplish their individual objectives, they do not describe a Stepper exercise machine that utilizes compressive resistance. Most do not disclose a Stepper whereby the foot pedals are fixed to an axel above the level of the foot pedals. None disclose such a connection with a single rod for each foot pedal. The importance of the attachment is that the attachment changes the movement utilized by the machine. The change in

movement produces a smoother, more ergonomic positioning of the feet and legs while exercising. The motion of user the present invention also more closely emulates skiing. By eliminating attachment to a single affixing rod, the machine according to the present invention is simpler to manufacture and less intimidating to operate.

Previous machines have used extensive resistance to provide resistance force. Compressive resistance devices have been rare and have not provided a singular resistance mechanism for resistance in more than one direction.

In this respect, the exercise device according to the present invention departs substantially from the usual designs in the prior art. In doing so, this invention provides a smoother, more ergonomic exercise experience that more closely resembles skiing while simultaneously provides a new compression resistance system that likewise produces a more ergonomic experience.

SUMMARY OF THE INVENTION

In view of the foregoing disadvantages inherent in the known types of exercise machines, this invention provides an improved exercise machine. As such, the present invention's general purpose is to provide a new and improved exercise machine that will utilize a compression resistance mechanism and provide a more accurate and ergonomic simulated experience. In order to attain this goal, the exercise machine comprises a base having a vertical axel and a rotative body placed upon the vertical axel, said body having a horizontal axel. Footpad arms extend from the horizontal axel and are fixedly connected to the top of the vertical axel with ball joint bearing rods. The resistance device is a compressive resistance device and is connected to the rotative body and the base so that when the rotative body moves, the resistance device is compressed and resistive force is thereby generated. The compressive resistance device is at least one compressible cylinder mounted on a base rod, said cylinder between two blocking bodies and the rod capable of movement through one of said bodies. As the rod moves through the one body, the other compresses the at least one cylinder against the first.

The more important features of the invention have thus been outlined in order that the more detailed description that follows may be better understood and in order that the present contribution to the art may better be appreciated. Additional features of the invention will be described hereinafter and will form the subject matter of the claims that follow.

Many objects of this invention will appear from the following description and appended claims, reference being made to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

As such, those skilled in the art will appreciate that the conception, upon which this disclosure is based, may readily be utilized as a basis for the designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as including such equivalent constructions insofar as they do not depart from the spirit and scope of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a top plan view of the exerciser according to the present invention.

Figure 2 is a side elevation of the exerciser according to the present invention

Figure 3 is a cross-section of the resistance device according to the present invention.

Figure 3a is a front elevation of the thrust block of the invention.

Figure 4 is an exploded view of the exercise device according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the drawings, the preferred embodiment of the resistance device shall be explained in the context of an improved exercise device, utilizing the resistance device. As seen in FIGS. 1 and 2, the exercise device is a "step" variety device; namely, the user actuates the device by moving the users' legs upwards and downwards, in a "stepping" fashion. The particular device is used to simulate a skiing exercise by simultaneously moving the user's legs in a lateral sweeping motion while the user is "stepping". Generally, the machine has a base 4 providing support for the machine. Mounted upon base 4 is a rotative body 5, unto which are attached the resistance mechanism 3 and footpad arms 6.

Resistance mechanism 3 is shown in further detail in FIG. 3. In its preferred embodiment, mechanism 3 comprises base rod 30 and plurality of compressible cylinders 32 forming a coaxially related stack upon base rod 30. At the external end of base rod 30 is a handle 38 that is threadingly engaged with base rod 30. While the preferred embodiment dictates a removable handle, any construction that would abut the stack of cylinders 32 and would be fixedly attached to base rod 30 would suffice. In the preferred embodiment, cylinders may be added and replaced, thereby providing varying resistance levels, dependent upon the general compressibility of the cylinders. Ideal materials for the cylinders include rubbers and plastics, though any compressible material and structure, such as metal springs and composite structures, may be used. Bushings 36 are positioned between cylinders 32 and base rod 30. Bushings 36 should be a generally non-compressible material. Bushings 36 not only provide reduced friction between cylinders 32 and base rod 30, but also provide a compression fail safe for cylinders 32. A bushing 36 is positioned at either end of each cylinder 32. As the cylinders 32 are compressed, eventually bushings 36 associated with a cylinder 32 will contact each other, thereby arresting compression of the cylinder 32 before cylinder 32 reaches a crucial and destructive state of deformation.

Abutting the opposite end of the cylinder stack is thrust block 34. Thrust block 34, shown in more detail in FIG. 3a, is comprised of a block body 31 with two planar faces and a pivot axel 33 extending downward from block body. Pivot axel 33 is fixedly and pivotally inserted through

base 4. Block body has a hole 35 bored through its planar faces. Base rod 30 is inserted through hole 37. On the interior end of base rod 30, opposite the thrust block 34 from cylinders 32, is an attachment interface 35, for interfacing with the rotative body 5.

Figure 4 depicts the remainder of the components of the invention in an exploded view. Base 4 is comprised of a central base support 40, through which pivot axel 33 is generally centrally inserted at hole 48, and, preferably, at least two support arms 42, 44. In this depiction, support arms 42, 44 are perpendicular to central base support 40 with arm 44 positioned beneath the fore end of central base support 40, though any configuration of base and any number of support arms lending to stability may be utilized. Extending vertically from central base support 40, at the extreme front end is vertical axel 46.

Rotative body 5 is inserted over vertical axel 46. Rotative body 5 is essentially a cylinder 50. From the bottom of cylinder 50, extends tongue 54 and horizontal axel 52, both diametrically opposite the other. Footpad arms 60 are cantileverally coupled to horizontal axel 52 and are supplied with footpads 62. Tongue 54 interfaces with base rod interface 35 in a pivotal manner. Rod arms 7 are attached to footpad arms 60 and the top of the vertical axis 46. Rod arms 7 have a central rod 70 with ball joints 72 and 74 at either end of rod 70. At the top of vertical axis 46 is rod mount 76, extending outward from vertical axis 46 and thereby improving clearance of rod arms 7 with rotative body 5 while the machine is in motion.

In use, a user applies force to one footpad 62 at a time. Depressing footpad and associated footpad arm 60 pulls rod arm 7 downwards and forwards, thereby twisting rotative body 5 about vertical axel 46. The twisting of rotative body 5 twists the body of the user, as footpad arms 60 twist with rotative body 5. Twisting also draws base rod 30 through cylinder stack 34, such that resistance mechanism 3 pivots in the direction opposite the user's body and cylinders stack 34 is compressed, providing resistance. As the user ceases to apply pressure, the compressive energy stored in cylinder stack 34 is released, returning the machine, and the user, to a baseline position. User then applies pressure with the opposite foot, repeating the process.

Although the present invention has been described with reference to preferred embodiments, numerous modifications and variations can be made and still the result will come within the scope of the invention. No limitation with respect to the specific embodiments disclosed herein is intended or should be inferred.